Amendments to the Specification:

On page 6 line 10 please amend the following paragraph:

Source probe 72 and detection probe 75 are mounted on a support member (for example, shown in Figs. 2, 3, 4, 4A) constructed to achieve a selected position of the fibers and a desired separation of the input ports and the detection ports. The support member can also transmit pressure to the fiber tips for improved coupling of light to the tissue. A connected spectrophotometer (such as a TRS-pulse, PMS, CW, or phased array spectrophotometer) probes deep tissue at large separations of the ports (ρ = 5 cm to 10 cm) and probes a dermal layer at small separations (ρ = 0.5 cm to 2 cm).

On page 12 line 1 please amend the following two paragraph:

Referring to Figs. 3 and 3A, a handheld hairbrush optical coupler 10, has two groups of fibers 16 and 18 protruding from the under surface of the lower portion of the hairbrush support 14. In one embodiment one group leads to a single light source and the other group leads to a single detector. Between the sections 16, 18 populated by fibers there is a barrier 20 of conformable substance adapted to engage the surface and prevent travel of light directly along the surface from source to detector. In the embodiment shown, the groupings of fibers having length L of approximately 2 cm and a width w of 1 cm. The overall hairbrush has a length of about 10 cm and a width about 6 cm in the case where L_1 is 6 cm.

The design of the embodiment of Figs. 3 and 3A can be scaled for examination of tissue at different depths keeping in mind that the photon migration path of the scattering light from source to detector follows a banana-like probability configuration in which the mean depth is about one-half the source-to-detector spacing. In an embodiment suitable for hematoma detection (hematoma detector, shown in Fig. 1, or hematoma monitor shown in Fig. 3) where it is wished to examine tissue to a mean

depth of approximately 3 cm, the distance 1 between the centers of the source and detector groupings of fibers is approximately 6 cm. For shallower imaging, the distance L, is shortened. In certain embodiments, the fiber groupings 16 and 18 are made laterally adjustable along the length of the hairbrush handle, whereas in other instances different sizes of hairbrushes are employed for different L_1 spacings.

On page 13 line 30 please amend the following paragraph:

Referring now to the embodiment of Figs. 4 and 4A, in this case a hairbrush 30 presents an array of fibers in known position across the under surface of the hairbrush support 34. Whereas individual fibers 36 can be advantageously employed both as source fibers for delivering light to the tissue and at a later time as detector fibers while other fibers deliver light to the tissue, in some cases it is preferred to have special purpose fibers. That is the arrangement shown in Figs. 4 and 4A. Light delivering or source fibers are indicated at 36a and detector fibers at 36b. Whereas a known location of the fibers is important, and a regular pattern is usually convenient, a regular pattern is not required. In fact to some extent there is a degree of irregularity in the pattern shown in Fig. 3A. The controller and processor for this array system can be employed in known ways. A common way is to illuminate a single fiber or single local group of fibers that act as a single fiber at any one time, and to proceed through the array on that basis, while taking readings from all of the detector fibers or groups of detector fibers that act as a single detection fiber. The resulting data in digital form is assembled as a matrix and suitably processed. By examination of the matrix after scanning through the entire array, it is possible to generate a back projection image of the area examined. Use of such a hairbrush with PM or TRS (pulse) techniques can enhance the image produced.

On page 16 line 10 please amend the following two paragraphs:

In Fig. 5, three locations, and in Fig. 5A, one location for the hairbrush of Fig. 3 are shown. The hairbrush placed on the left side may be used to produce reference data for the hairbrush placed on the right side of the head and vice versa. On the other hand, the hairbrush may simply be moved over the object of interest to observe differences that may have been caused by abnormalities, e.g., to monitor recurrence of hematoma.

Referring to FIG. 6, in the case of use of hairbrushes as pictured in 4 and 4A, precise positioning is especially important to set a base line. The helmet 40 has cutouts that are shaped as shown in 6B to receive the hairbrush 30, the cutout 44 being bounded by rigid sides 45 that serve as guides to precisely locate the hairbrush and guide it into engagement with the head, with the probes penetrating the free hair 42.

On page 17 line 3 please amend the following paragraph:

The set of Figs. 7 through 11 are diagrammatic representations of a hairbrush optical coupler 60. The handle 66 of the hairbrush 60 **[[66]]** comprises an upper part 62 and a lower part 64. The upper part of the handle is fixed to the fibers at least during use, and the lower part of the handle is slidable along the fibers as it moves together or apart from the upper part of the handle. In Fig. 7 the parts are shown pushed together.